

**Notice of Allowability**

Application No.	Applicant(s)	
10/600,107	SALLA ET AL.	
Examiner	Art Unit	
Seyed Azarian	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS**. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to 1/16/2008, telephone interview, and fax inquiry filed on January 31, 2008.
2.  The allowed claim(s) is/are 1-25.
3.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All
  - b)  Some\*
  - c)  None of the:
  1.  Certified copies of the priority documents have been received.
  2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5.  CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached  
1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.
  - (b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of  
Paper No./Mail Date \_\_\_\_\_.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1.  Notice of References Cited (PTO-892)
2.  Notice of Draftsperson's Patent Drawing Review (PTO-948)
3.  Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_.
4.  Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5.  Notice of Informal Patent Application
6.  Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7.  Examiner's Amendment/Comment
8.  Examiner's Statement of Reasons for Allowance
9.  Other \_\_\_\_\_.

### **Response to Amendment**

1. Based on applicant's amendment, filed 1/16/2008, see page 8 through 17 of the remarks, also telephone interview and fax inquiry filed on January 31, 2008, with respect to amended claims 1, 22, 24 and 25, have been fully considered and are persuasive, upon further consideration the double patenting rejection and rejection, of 103(a) for claims 1-25, are hereby withdrawn.

The claims 1-25 are allowed.

### **EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it must be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Applicants Attorney (Mr. William J. Zychlewicz, Reg No. 51,366), on January 31, 2008, without traverse.

#### **The amended claims 1, 22, 24 and 25 as follows:**

Claim 1. (Currently Amended) A method for retrospective internal gating comprising: acquiring images at multiple z-locations z<sub>1</sub>.....z<sub>n</sub> and at different times t<sub>1</sub>...t<sub>n</sub> at each of the z-locations to obtain a plurality of acquired image sets, each acquired image set including only the images acquired at a single one of the z-locations;

designating one of the images in a temporal sequence t<sub>1</sub>....t<sub>n</sub> at one of the z-locations

as a reference image;

determine a closest image in which motion of an organ is minimal with respect to a position of the organ in the reference image, the closest image being an image in the temporal sequence t<sub>1</sub>....t<sub>n</sub> at a z-location adjacent the z-location of the reference image; and  
reordering the images within at least one of the acquired image sets to obtain at least one synchronized image set that includes at least two images that appear to have been acquired contemporaneously, each synchronized image set including only the images acquired at a single one of the z-locations.

Claim 22. (Currently Amended) A computer-readable medium encoded with a program configured to:

acquire images at multiple z-locations z<sub>1</sub>...z<sub>n</sub> and at different times t<sub>1</sub>...t<sub>n</sub> at each of the z-locations to obtain a plurality of acquired image sets, each acquired image set including only the images acquired at a single one of the z-locations;

extract motion information from the images by using temporal data acquired at different times t<sub>1</sub>...t<sub>n</sub> at each of the z-locations and using a mean intensity value of at least a portion of one of the images;

designate one of the images in a temporal sequence t<sub>1</sub>....t<sub>n</sub> at one of the z-locations as a reference image;

determine a closest image in which motion of an organ is minimal with respect to a position of the organ in the reference image, the closest image being an image in the temporal sequence t<sub>1</sub>....t<sub>n</sub> at a z-location adjacent the z-location of the reference image; and

reorder the images within at least one of the acquired image sets to obtain at least one synchronized image set, each synchronized image set including only the images acquired at a single one of the z-locations.

Claim 24. (Currently Amended) An imaging system comprising:

a scanner configured to generate attenuation data by scanning an object; and  
a controller electrically coupled to the scanner, the controller configured to:  
acquire images at multiple z-locations  $z_1 \dots z_n$  and at different times  $t_1 \dots t_n$  at each of the z-locations to obtain a plurality of acquired image sets, each acquired image set including only the images acquired at a single one of the z-locations;

designate one of the images in a temporal sequence  $t_1 \dots t_n$  at one of the z-locations as a reference image;

determine a closest image in which motion of an organ is minimal with respect to a position of the organ in the reference image, the closest image being an image in the temporal sequence  $t_1 \dots t_n$  at a z-location adjacent the z-location of the reference image; and

reorder the images within at least one of the acquired image sets to obtain at least one synchronized image set that includes at least two images that appear to have been acquired contemporaneously, each synchronized image set including only the images acquired at a single one of the z-locations.

Claim 25. (Currently Amended) A computed tomography (CT) imaging system comprising:

a radiation source;  
a radiation detector; and

a computer electrically coupled to the source and the detector, the computer configured to:

acquire CT images at multiple zlocations z1...zn and at different times t1...tn at each of the z-locations to obtain a plurality of acquired image sets, each acquired image set including only the CT images acquired at a single one of the z-locations;

designate one of the images in a temporal sequence t1....tn at one of the z-locations as a reference image;

determine a closest image in which motion of an organ is minimal with respect to a position of the organ in the reference image, the closest image being an image in the temporal sequence t1....tn at a z-location adjacent the z-location of the reference image; and

reorder the CT images within at least one of the acquired image sets to obtain at least one synchronized image set that includes at least two images that appear to have been acquired contemporaneously, each synchronized image set including only the CT images acquired at a single one of the z-locations.

## REASONS FOR ALLOWANCE

3. The following is an examiner's statement of reasons for allowance.  
This invention relates generally, to imaging systems and methods and more particularly to systems and methods for retrospective internal gating.

Based on applicant's amendment, with respect to claim 1 representative of claims 22-25 the closest prior art of record (Yavuz 074) and (Yavuz 712), references is directed to generation of computed tomographic images. More particularly, the invention relates to reconstruction of multiple, tomographic slice images to represent an imaged object in three spatial dimensions,

using four-dimensional tomographic projection data, , but do not teach or suggest, among other things, " designating one of the images in a temporal sequence t1 ....tn at one of the z-locations as a reference image, determine a closest image in which motion of an organ is minimal with respect to a position of the organ in the reference image, the closest image being an image in the temporal sequence t1....tn at a z-location adjacent the z-location of the reference image; and . reordering the images within at least one of the acquired image sets to obtain at least one synchronized image set that includes at least two images that appear to have been acquired contemporaneously, each synchronized image set including only the images acquired at a single one of the z-locations".

These key features in combination with the other features of the claimed invention are neither taught nor suggested by (Yavuz 074) and (Yavuz 712) prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### Contact Information

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (571) 272-7443. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR. Status information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Seyed Azarian*  
Patent Examiner  
Group Art Unit 2624  
February 2, 2008



SEYED AZARIAN  
PRIMARY EXAMINER